



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8

999 18<sup>TH</sup> STREET- SUITE 200

DENVER, CO 80202-2466

Phone 800-227-8917

<http://www.epa.gov/region08>

*Modification - Minor  
mod Approved*

**AUTHORIZATION FOR ADDITIONAL WELL**

**UIC Area Permit No: UT20736-00000**

The Antelope Creek Waterflood Final UIC Area Permit No. UT20736-00000, effective July 12, 1994, authorizes injection for the purpose of enhanced oil recovery into multiple lenticular sand units which are distributed throughout the lower portion of the Green River Formation. On January 19, 2005, the permittee provided notice to the Director concerning the following additional enhanced recovery injection well:

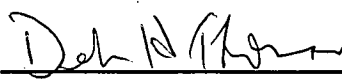
Well Name:	<u><b>Ute Tribal 18-12</b></u>
EPA Well ID Number:	<u><b>UT20736-06680</b></u>
Location:	2092 ft FSL & 549 ft FWL NW SW Sec. 18 - T5S - R3W Duchesne County, Utah.

Pursuant to 40 CFR §144.33, Area UIC Permit No. UT20736-00000 authorizes the permittee to construct and operate, convert, or plug and abandon additional enhanced recovery injection wells within the area permit. This well was determined to satisfy additional well criteria required by the permit.

This well is subject to all provisions of UIC Area Permit No. UT20736-00000, as modified and as specified in the Well Specific Requirements detailed below. This Authorization shall expire one year after the Effective Date unless the permittee has converted the well to injection or submits a written request to extend this Authorization prior to the expiration date.

This Authorization is effective upon signature.

Date: JUN 21 2006

  
for **Stephen S. Tuber**  
\* Assistant Regional Administrator  
Office of Partnerships and Regulatory Assistance

\* The person holding this title is referred to as the Director throughout the Permit and Authorization



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*Scan under*

**ON FOR ADDITIONAL WELL**

*UT 20736 - 00000  
66  
Modification - Minor*

*mod Approved*

*7/21/2006*

*Will need to link  
w/ UT 20736 - 06680  
in new database also  
under 81 Add Well to Area  
Permit.*

Permit No: UT20736-00000

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**UT20736-06680**

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Office of Partnerships and Regulatory Assistance

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## **WELL-SPECIFIC REQUIREMENTS**

Well Name: **Ute Tribal 18-12**  
EPA Well ID Number: **UT20736-06680**

**Prior to commencing injection operations, the permittee shall submit the following information and receive written Authority to Inject from the Director:**

1. a successful Part I (Internal) Mechanical Integrity test (MIT);
2. pore pressure calculation of the proposed injection zone; and
3. completed Well Rework Record EPA Form No. 7520-12 and schematic diagram.

**Approved Injection Zone:** Injection is approved between the base of the Green River A Lime Marker at 3929 ft to the top of the Basal Carbonate at 5944 ft.

**Maximum Allowable Injection Pressure (MAIP):** The initial MAIP is **1590 psig**, based on the following calculation:

$$\begin{aligned} \text{MAIP} &= [\text{FG} - (0.433)(\text{SG})] * \text{D}, \text{ where} \\ \text{FG} &= 0.80 \text{ psi/ft} \quad \text{SG} = 1.002 \quad \text{D} = \mathbf{4351 \text{ ft}} \text{ (top perforation depth KB)} \\ \text{MAIP} &= \mathbf{1590 \text{ psi}} \end{aligned}$$

UIC Area Permit No. UT20736-00000 also provides the opportunity for the permittee to request a change of the MAIP based upon results of a step rate test that demonstrates the formation breakdown pressure will not be exceeded.

**Well Construction and Corrective Action:** **No Corrective Action is required.** Based on review of well construction and cementing records, including a CBL, well construction is considered adequate to prevent fluid movement out of the injection zone and into USDWs.

**Tubing** 2-3/8" or similar size injection tubing is approved; the packer shall be set at  
**and Packer:** a depth no more than 100 ft above the top perforation.

**Corrective Action for Wells in Area of Review:** **No Corrective Action is required.** The following well or wells that penetrate the confining zone are within or proximate to a 1/4 mile radius around the Ute Tribal 18-12 were evaluated to determine if any corrective action is necessary to prevent fluid movement into USDWs:

Well: Ute Tribal 18-05	≈ UT20736-04472	Location: SW NW Sec 18 - T5S - R3W
Well: Ute Tribal 18-12M	•	Location: NW SW Sec 18 - T5S - R3W

**Demonstration of Mechanical Integrity:** A successful demonstration of Part I (Internal) Mechanical Integrity using a standard Casing-Tubing pressure test is required prior to injection and at least once every five years thereafter. EPA reviewed the cementing records and determined the cement will provide an effective barrier to significant upward movement of fluids through vertical channels adjacent to the well bore pursuant to 40 CFR 146.8 (a)(2). Therefore, further demonstration of Part II (External) Mechanical Integrity is **not** required at this time.

**Demonstration of Financial Responsibility:** The applicant has demonstrated financial responsibility in the amount of \$15,000 via a Surety Bond that has been reviewed and approved by the EPA.

**Plugging and Abandonment:** The well shall be plugged in a manner that isolates the injection zone and prevents movement of fluid into or between USDWs, and in accordance with all applicable federal, state and local requirements. Tubing, packers, and any downhole apparatus shall be removed. Class A, C, G, and H cements, with additives such as accelerators and retarders that control or enhance cement properties, may be used for plugs; however, volume extending additives and gel cements are not approved for plug use. Plug placement shall be verified by tagging. Plugging gel of at least 9.2 lb/gal shall be placed between all plugs. A minimum 50 ft surface plug shall be set inside and outside of the surface casing to seal pathways for fluid migration into the subsurface. Within sixty (60) days after plugging the owner or operator shall submit Plugging Record (EPA Form 7520-13) to the Director. The Plugging Record must be certified as accurate and complete by the person responsible for the plugging operation. At a minimum the following plugs shall be emplaced:

- PLUG NO. 1: Set a cast iron bridge plug (CIBP) no more than 50 ft above the top perforation at 4351 ft with a minimum 20 ft cement plug on top of the CIBP.
  - PLUG NO. 2: Set a minimum 250 ft cement plug inside of the 5-1/2" casing across the Trona Zone and the Mahogany Shale, in the interval between at least approximately 2700 ft to 2850 ft.
  - PLUG NO. 3: Set a minimum 50 ft cement plug on the backside of the 5-1/2" casing, across the surface casing shoe at 266 ft.
  - PLUG NO. 4: Set a cement plug inside of the 5-1/2" casing, from at least 240 ft to 290 ft.
  - PLUG NO. 5: Set a cement plug, on the backside of the 5-1/2" casing, from surface to a depth of at least 50 ft.
  - PLUG NO. 6: Set a cement plug inside of the 5-1/2" casing from surface to a depth of at least 50 ft.
- Cut off surface and 5-1/2" casing at least 4 ft below ground level and set P&A marker; submit Sundry Notices and all necessary data as required by the EPA and other regulatory agencies.

## **WELL-SPECIFIC CONSIDERATIONS**

Well Name: **Ute Tribal 18-12**  
EPA Well ID Number: **UT20736-06680**

**Underground Sources of Drinking Water (USDWs):** USDWs in the Antelope Creek Waterflood area generally may occur within the Uinta Formation, which extends from the surface to the top of the Green River Formation at approximately 1530 ft. According to "*Base of Moderately Saline Ground Water in the Uinta Basin, Utah, State of Utah Technical Publication No. 92,*" the base of moderately saline ground water is found at approximately 250 ft below ground surface at this well location. The top of casing cement in this well is at 2280 ft below ground surface (CBL).

**Confining Zone:** The Confining Zone at this location is approximately 209 ft of interbedded limestone and shale between the depths of 3720 ft to 3929 ft (KB) which directly overlies the Injection Zone, based on correlation to the Antelope Creek Ute Tribal 04-03 well Type Log. Additional impermeable lacustrine shale beds above the Confining Zone provide for further protection for any overlying USDW.

**Injection Zone:** The Injection Zone at this well location is an approximately 2015 ft section of multiple lenticular sand units interbedded with shale, marlstone and limestone from the base of the Confining Zone at 3929 ft (KB) to the top of the Basal Carbonate Formation at 5944 ft (KB), based on correlation to the Antelope Creek Ute Tribal 04-03 well Type Log.

**Well Construction:** The CBL shows 80% or greater bond between approximately 3795 ft to 3824 ft, between 3854 ft to 3878 ft, and from 3918 ft to 3942 ft and deeper, which is considered adequate to prevent migration of fluid out of the injection zone.

**Surface casing:** 8-5/8" casing is set at 266 ft in a 12-1/4" hole, using 200 sacks cement circulated to the surface.

**Longstring casing:** 5-1/2" casing is set at 6026 ft (KB) in a 7-7/8" 6050 ft Total Depth hole with a plugged back total depth (PBSD) of 5982 ft, cemented with 415 sacks cement.  
Top of Cement (TOC): 2280 ft (KB) CBL.

**Perforations:** top perforation: **4351 ft** Bottom perforation: **5196 ft**

**Wells in Area of Review (AOR):** Construction and cementing records, including cement bond logs (CBL) as available, for the following well or wells in the 1/4 mile AOR that penetrate the confining zone, were reviewed. Well construction was found adequate to prevent fluid movement out of the injection zone and into USDWs.

Well: Ute Tribal 18-05	UT20736-04472	TOC: 1700 ft (calc)
Well: Ute Tribal 18-12M	●	TOC: 580 ft (calc)